7-1

EXHIBIT A

OUIII AR 633

U.S. Department of Energy

Monticello Operable Unit III and
Permeable Reactive Treatment (PeRT) Wall Projects

Drilling Statement of Work—Monticello, Utah

April 2000

Prepared by
U.S. Department of Energy
Grand Junction Office
Grand Junction, Colorado

Project Number PTW–121–0003–00–000
Document Number K00068AA

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Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFA	Federal Facilities Agreement
ft	feet
IROD	Interim Record of Decision
MMTS	Monticello Mill Tailings Site
OU	operable unit
PDC	Project Drilling Coordinator
PeRT	permeable reactive treatment
SOW	Statement of Work

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1.0 Introduction

The U.S. Department of Energy (DOE) completed surface remediation of uranium mill tailings and associated materials at the former milling site located in Monticello, Utah (a Site Location Map is shown in Figure 1–1). The tailings were moved to a nearby repository. The groundwater beneath and downgradient of the Monticello Mill Tailings Site (MMTS) has become contaminated with radionuclides and heavy metals.

This Statement of Work (SOW) describes the activities for installation of monitoring wells that will be used to evaluate ground water quality on and downgradient of the MMTS (Figures 1–2 and 1–3).

1.1 Site Location and Access

The MMTS is located at approximately 6,700 feet (ft) above sea level in San Juan County in and near the city of Monticello. The monitoring wells will be placed on the Millsite and on private land directly downgradient of the MMTS. A lease arrangement with the landowner allows site access.

1.2 Site Background

MMTS is the site of a former vanadium- and uranium-processing mill that operated between 1942 and 1960. In 1961, the Atomic Energy Commission started to stabilize, regrade, and vegetate several mill tailings piles. Most of the Millsite buildings were dismantled and excessed by the end of 1964. In 1980, the Monticello Remedial Action Project was established to remediate the Millsite and peripheral properties and to contain or dispose of the tailings. To facilitate site cleanup, DOE, the U.S. Environmental Protection Agency (EPA), and the State of Utah entered into a Federal Facilities Agreement (FFA) in early 1989 under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Under this agreement, DOE serves as the Federal lead agency and provides the staff and resources to implement cleanup at the MMTS. EPA and the State of Utah share the responsibility for oversight; EPA has the ultimate oversight responsibility. The FFA stipulates that the MMTS be organized into three operable units (OUs), with OU III focused on the site groundwater.

In 1999, an Interim Record of Decision (IROD) was signed for OU III. The IROD specified that groundwater monitoring would continue on a quarterly basis. In addition, the IROD called for the construction of a permeable reactive treatment (PeRT) wall as an interim treatment for the contaminated groundwater. A PeRT wall is a passive remediation system that chemically reduces concentrations of contaminants as they flow through a reactive material. The reactive material used at Monticello is zero-valent iron (iron filings). Most of the monitoring wells under this SOW will be constructed adjacent to the PeRT wall.

1.3 Hydrologic Setting

The hydrologic units associated with the site are an upper alluvial aquifer consisting mostly of unconsolidated sand, gravel and cobbles, an underlying bedrock aquitard comprising Mancos Shale and Dakota Sandstone of Cretaceous age, and the underlying Burro Canyon Formation, also of Cretaceous age. Below the Burro Canyon Formation is the Brushy Basin Member of the Morrison Formation, which is relatively impermeable to groundwater flow.

The focus of this drilling project is the alluvial aquifer. In the area of interest, about 15 to 30 ft of alluvium overlies the bedrock. In general, the alluvial materials consist of about 3 to 10 ft of sand, gravel, and cobbles, that are overlain by silt and fine sand. The bedrock that will be encountered includes poorly indurated mudstones and hard sandstone.

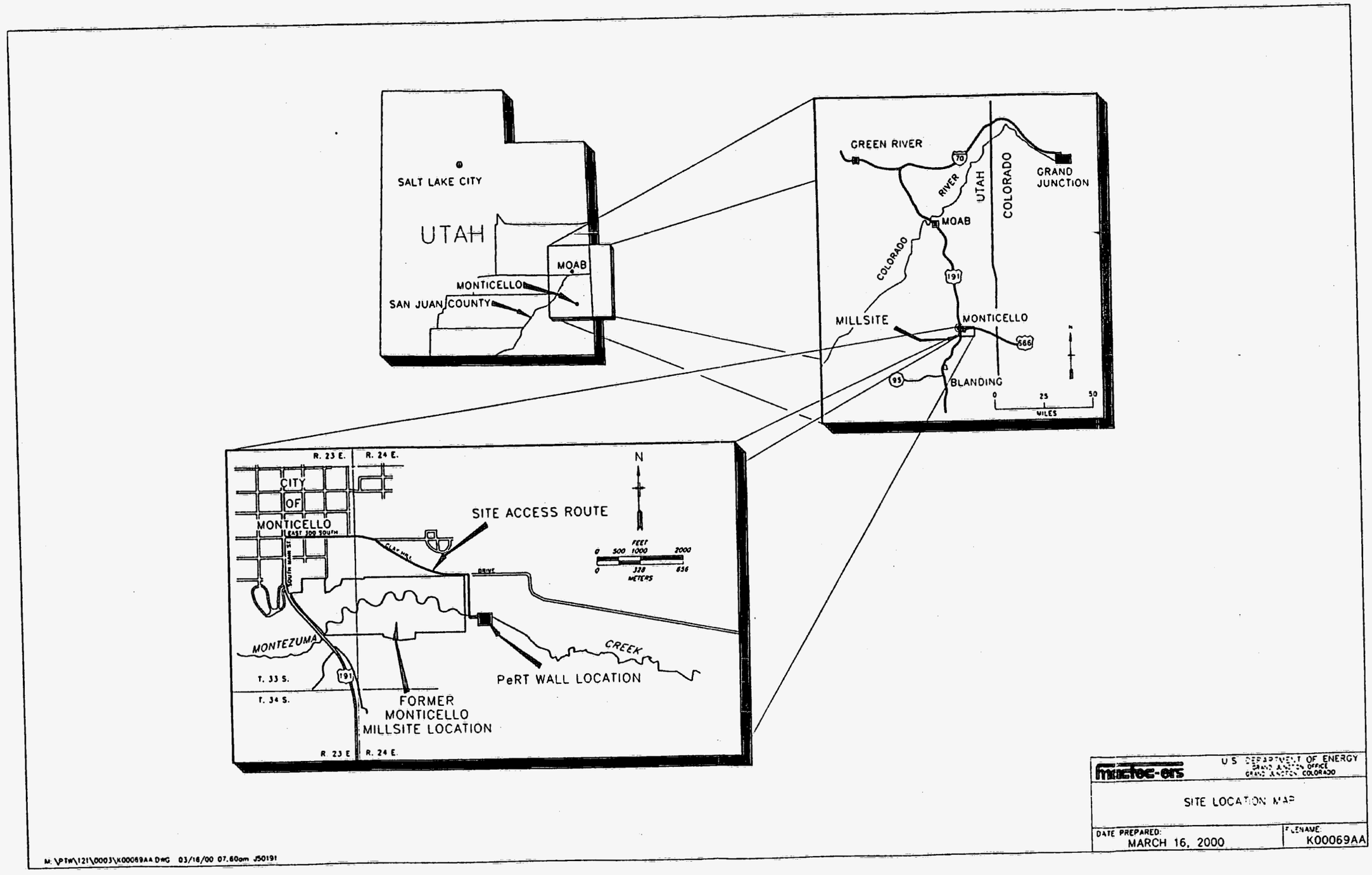

Figure 1–1. Site Location Map

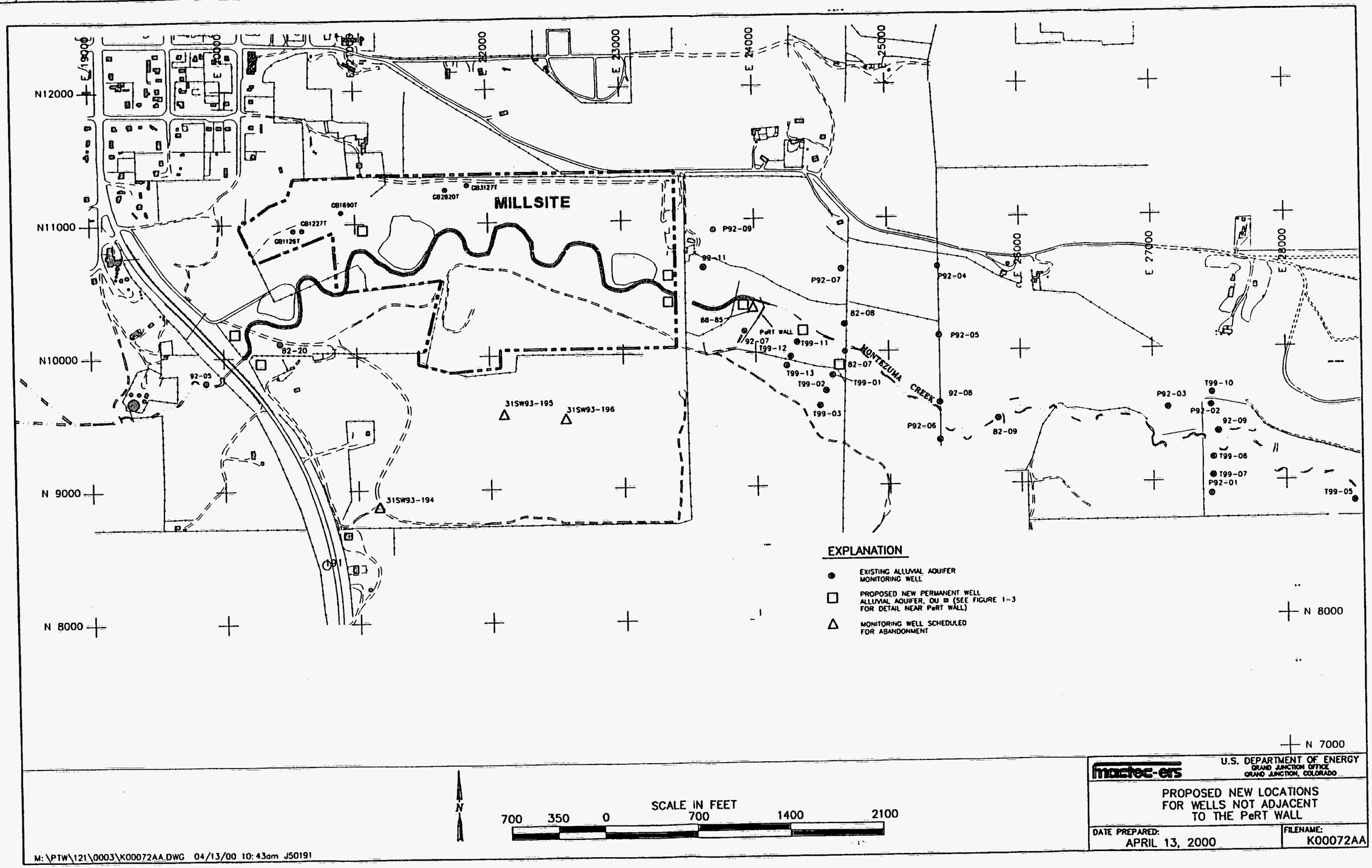

Figure 1–2. Proposed New Permanent Well Locations and Locations for Abandonment for OU III Not Adjacent to the PeRT Wall

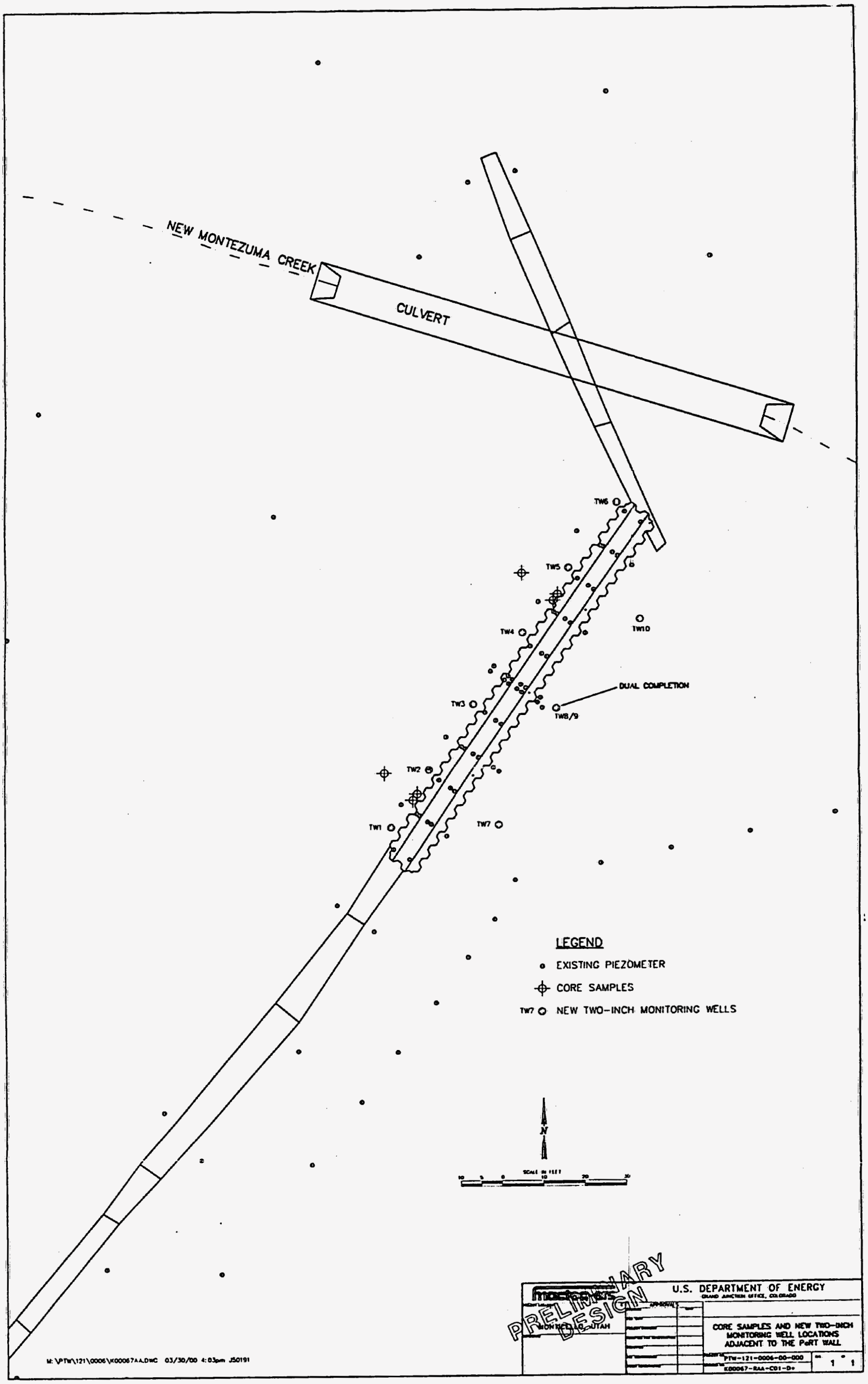

Figure 1–3. Core Samples and New Two-Inch Monitoring Well Locations Adjacent to the PeRT Wall

2.0 Objective and Scope

The objective of this SOW is to install monitoring wells to better understand the migration of contaminants within OU III, with an emphasis on the PeRT wall. The monitoring wells will be periodically sampled, used as part of a tracer study, and enable the use of a colloidal borescope to evaluate groundwater flow rates and direction. Another objective of this SOW is to obtain representative core samples immediately upgradient of the PeRT wall to evaluate any changes in the alluvial materials that may have occurred during the PeRT wall installation.

2.1 Drilling Scope

The general scope of work is listed below (see Plate 1 for the locations of the monitoring wells and core samples). Performance requirements and specifications are presented in Section 3.0.

- Drill 10 two-inch monitoring wells in the vicinity of the PeRT wall.
- Drill 8 two-inch monitoring wells on the Millsite, upgradient and downgradient of the PeRT wall.
- Take 6 core samples (without monitoring well installations) immediately upgradient of the PeRT wall; abandon core holes (soil borings). Core samples will be turned over to MACTEC–ERS.
- Abandon 4 existing monitoring wells.

Table 3–1 lists the well or soil boring for coreholes number, well depth, and screen interval information.

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3.0 Performance Requirements and Specifications

Specifications and requirements for the drilling tasks are presented in this section. All well locations, the number of core samples and wells, well completion material and dimensions, and the depths of wells have been established by MACTEC–ERS but are subject to change as additional information is obtained during the work. All requirements and specifications of this solicitation are considered minimum and therefore, equal to one another in terms of importance. Responses failing to meet all of these requirements and specifications will not be considered further for award. The Subcontractor shall furnish all necessary labor, equipment, material, and supervision required to complete the work described herein.

The Subcontractor shall drill boreholes that are sufficiently plumb and straight so that there will be no interference with installation, alignment, operation, or future removal of pumps or other down-hole equipment. The Subcontractor shall not use contaminating additives (e.g., diesel fuel, oil, barite), hydrocarbon-based lubricants (e.g., grease or oil), and biocides (e.g., formaldehyde) in the borehole or well. The Subcontractor shall use only nonhydrocarbon-based lubricants, such as silicon, Teflon, or vegetable oil on any downhole equipment or tools.

3.1 Monitor Well and Corehole Drilling

The Subcontractor shall use a dual cased drilling system that uses high frequency mechanical vibration to take continuous core samples and to advance the casing into the ground. The drilling equipment shall penetrate through surface soils, alluvial materials, and the underlying mudstone/sandstone aquitard up to 30-ft below ground surface. The Subcontractor shall furnish all necessary labor, equipment, and material required to complete the work in accordance with this SOW.

The Subcontractor shall collect continuous soil/rock samples until total depth has been reached, as determined by the Project Drilling Coordinator (PDC). Samples from the 6 cores adjacent to the PeRT wall shall be collected in clear, rigid Lexan® or equivalent sleeves with endcaps for observation and retention by the PDC. Cores obtained from the installation of monitoring wells shall be placed in flexible plastic sleeves.

MACTEC–ERS will reevaluate the depth of the monitor wells in the field and may alter the depths from those presented in Table 3–1.

3.2 Monitor Well Installation

The Subcontractor shall complete monitoring wells as nominal 2-inch I.D. wells (Table 3–1). The Subcontractor shall begin installation of the well materials when the desired total depth of the borehole is reached, as determined by the PDC. In general, each well will be set such that the bottom of the screen is at the same level as the bedrock surface. The Subcontractor shall measure the total depth of the borehole to the nearest tenth of a foot and report the measurement to the PDC. The Subcontractor shall install and complete the wells in accordance with Figures 3–1 and 3–2, Typical Well Completion Details. The Subcontractor shall complete well installations with a uniform and complete filling of the annular space with a filter pack, bentonite seal above the filter pack, and bentonite/cement grout that are free of voids or "bridges."

*Table 3–1. Monitor Well and Soil Boring Completion List**

Well or Soil Boring	Approximate Well or Soil Boring Depth (ft.)	Remarks
TW1	15	Flush-mount surface completion—Figure 3–1
TW2	15	
TW3	15	
TW4	15	
TW5	15	
TW6	15	
TW7	15	
TW8	15	
TW9	15	
TW10	30	
00–01	25	Above-ground surface completion—Figure 3–2
00–02	25	
00–03	25	
00–04	25	
00–05	25	
00–06	25	
00–07	25	
00–08	25	
SB00–01	15	Cores provided to MACTEC–ERS
SB00–02	15	
SB00–03	15	
SB00–04	15	
SB00–05	15	
SB00–06	15	

*All wells will be 2 inch, schedule 40 PVC.

The Subcontractor shall redrill any borehole that is too shallow due to "caving." If the boring is determined by the PDC to be too deep, the Subcontractor shall place sand into the borehole to the desired depth.

All well installation materials, e.g., screens, casings, primary and secondary filter packs, bentonite pellets, bentonite grout, and cement shall be delivered to each well site in factory sealed containers until used in the well installation. This material needs to be properly stored by the Subcontractor to protect it from damage or deterioration.

Well Development

MACTEC–ERS will develop all wells after the Subcontractor has installed them.

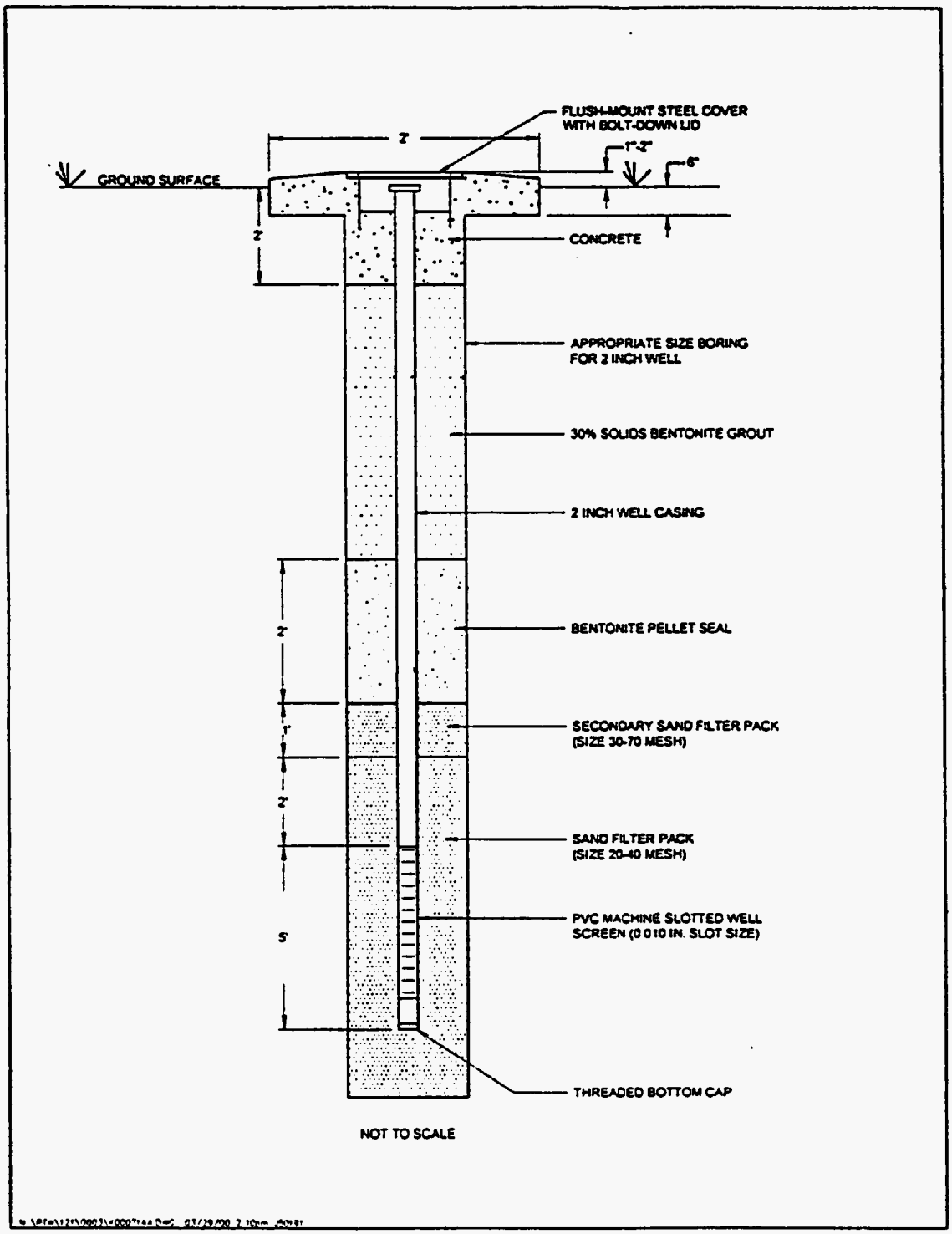

Figure 3-1. Typical Well Completion Detail; Flush-Mount Completion

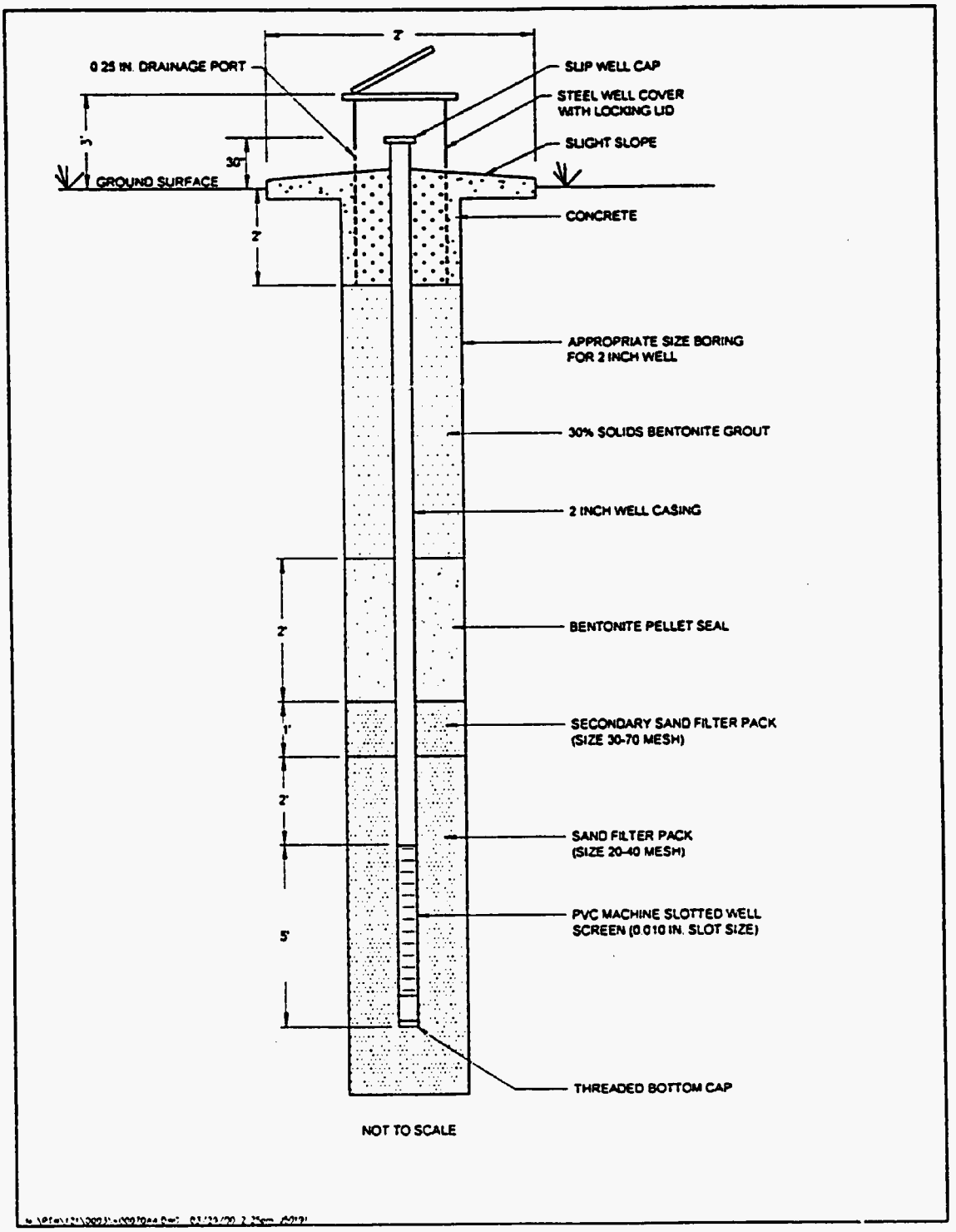

Figure 3-2. Typical Well Completion Detail; Above-Ground Completion

Well Completions

Borehole diameter: Sufficient size to provide a nominal 2-inch annular space around the entire circumference of the screened interval of the well.

Screen: Flush threaded, nominal 2-inch I.D. diameter, machine slotted, Schedule 40 PVC, slot size - 0.010-inch (TriLok or equivalent).

Casing: Flush threaded, nominal 2-inch I.D. diameter, Schedule 40 PVC.

Primary Filter pack: Colorado® silica sand, size 20-40 or equivalent.

Secondary Filter pack: Colorado® silica sand, size 30-70 or equivalent.

Bentonite seal: 1/4-inch bentonite pellets.

Grout: 30 percent high solids bentonite grout.

Top Cap: Schedule 40 PVC, (appropriate well size).

Concrete: Compressive strength 3,000 pounds per square inch at 28 days – "Ready mix" or equivalent.

Protective Outer Casing: Appropriate size premanufactured steel well protectors with hinged weather proof lockable lids for above-gradient completions. Appropriate size leak-resistant manholes with bolt down lid shall be used for flush-mount completions.

The Subcontractor shall measure the depth to the top of the primary filter pack to the nearest tenth of a foot and report the measurement to the PDC. If the top of the filter pack is not at the design depth, the Subcontractor shall install additional sand to bring the top of the primary filter pack to the desired depth.

The Subcontractor shall continue well installation with the placement of a minimum one foot secondary filter pack, Colorado® silica sand - size 30-70 or equivalent. The Subcontractor shall measure the depth to the top of the secondary filter pack to the nearest tenth of a foot and report the measurement to the PDC. If the top of the filter pack is not at the design depth, the Subcontractor shall install additional sand to bring the top of the secondary filter pack to the desired depth.

When the top of the secondary filter pack is at the correct height, as determined by the PDC, the Subcontractor shall then begin placement of a 2-ft bentonite seal (1/4-inch bentonite pellets). The bentonite pellets will be hydrated through the addition of water and allowed a 15 minute period for hydration and expansion of the pellets, prior to grout placement.

The Subcontractor shall install the 30 percent solids bentonite grout seal in the annular space from the top of the bentonite seal to within 2 ft of the ground surface. The Subcontractor shall place the grout by pumping it through a tremie pipe in one continuous action completely filling the annular space. The Subcontractor shall prepare the grout in accordance with the

manufacturer's instructions and supervision of the PDC. The remaining 2 ft of annular space will be filled with concrete.

The Subcontractor shall assume that installation of all material for the 2-inch monitor wells will be made through a tremie pipe. The tremie pipe shall not be raised more than one foot above the material level during installation. A weighted measuring tape or similar device will be used to measure the depth of the material as it is being placed. All measurements will be recorded on the Daily Drilling Report to the nearest one-tenth of a foot. Use of a tremie pipe may not be required at the discretion of the PDC.

3.3 Monitor Well Head Protection

The Subcontractor shall provide and install a Schedule 40 PVC top cap for the PVC well casing and an appropriate well cover as described above and shown in Figures 3–1 and 3–2. MACTEC–ERS will provide the locks. The well cover shall be centered in a 2-ft by 2-ft by 6-inch thick concrete pad that is continuous with the concrete used to fill the upper 2 ft of annular space. The top of the concrete pad shall extend 1- to 2-inches above ground level with a slight slope to facilitate drainage. The finished height of the lockable metal cap shall be a maximum of 36-inches above ground level.

3.4 Monitor Well Abandonment

The Subcontractor shall abandon four existing monitor wells. The well numbers well depth, borehole diameters, and casing/screen type are shown in Table 3–2. Well abandonment shall be done in accordance with the State of Utah Division of Water Rights, Administrative Rules for Water Well Drillers, R 655–4–12 U.A.C.

Table 3–2. Monitor Wells Scheduled for Abandonment

Well Number	Well Depth	Borehole Diameter	Casing/Screen Type
88–85	approximately 15 ft	8 in.	2.0 in. schedule 40 PVC
31SW93–194	25 ft.	8 in.	2.0 in. schedule 80 PVC
31SW93–195	105 ft.	9 in.	2.0 in. schedule 80 PVC
31SW93–196	71 ft.	8 in.	2.0 in. schedule 80 PVC

3.5 Source of Water

The Subcontractor shall obtain potable water for drilling and other tasks associated with the work from the Monticello City Fire Department. The Subcontractor shall have the necessary equipment to obtain, transport, and store water for use at the drill sites.

Tanks, hoses, pumps, and any other equipment used to transport or store the water shall be clean and free from all contamination. Further, the Subcontractor shall protect the water from contamination during storage.

3.6 Equipment Cleaning

The Subcontractor shall prevent the cross-contamination of all monitor wells by using high-pressure steam cleaning to remove debris from equipment at each drilling location before moving to a new location and before leaving the project site. Water from the approved water source shall be used for all cleaning operations. The PDC will direct equipment cleaning and deem it clean when it is visibly free of all soil, oil, grease, and previous fluids.

3.7 Drill Cuttings and Fluid Disposal

The Subcontractor shall evenly spread drill cuttings, if any, on the ground surface around the borehole after each borehole or well is completed. Containment of water used to clean equipment is not necessary.

3.8 Trash Disposal

The Subcontractor shall collect and dispose of job-generated trash at a minimum of one time per day, at the end of each day, and maintain proper site housekeeping at all times. The Subcontractor shall provide an on-site trash receptacle that shall be used for non-hazardous wastes only.

3.9 Equipment Maintenance

The Subcontractor may perform equipment maintenance, fueling, and repairs on location with the prior approval of the PDC. The Subcontractor shall perform immediate cleanup of petroleum-type spills at its own time and expense. If oil leakage is detected from various equipment the ground shall be protected with plastic sheeting, or diapering if the leak cannot be readily repaired.

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4.0 Contingencies and Site Procedures

This section includes procedures for operations at the site. Included in this section are references to specific Articles in the *Terms and Conditions for Subcontracts and Purchase Orders over $25,000* (Terms and Conditions) (GJO–PROC–114, August 1997) to the subcontract. The Subcontractor is reminded that although reference is made to certain Articles in the Terms and Conditions, all applicable Articles in the Terms and Conditions govern the subcontract.

4.1 Site Access

Most of the drilling and sampling sites are accessible by existing roads or open ground. The Subcontractor shall not move equipment off existing roads to the drilling sites without the approval of the PDC. Driving off established roads shall be kept to a minimum.

4.2 Site Conditions

The Subcontractor shall be knowledgeable of general and local site conditions that may affect the cost or quality of the performance of the work, including the suitability of the Subcontractor's equipment to perform the work. Refer to Article 40 of the Terms and Conditions.

4.3 Loss of Drilling Equipment and Hole Abandonment

Refer to Article 38 of the Terms and Conditions.

4.4 Daily Drilling Report

The Subcontractor shall furnish to the MACTEC–ERS PDC a complete daily (or shift) drilling log detailing all rig functions, depths, sample intervals, bit records, pipe tallies, casing, screen and other materials used, as well as any other pertinent drilling and safety data (including "tailgate" safety meetings and "rig inspections"). This information shall be recorded on the Daily Drilling Report furnished by MACTEC–ERS (Figure 4–1); ***or, subject to prior approval from MACTEC–ERS, on a Subcontractor-supplied form that contains the same information.*** **The Daily Drilling Report form shall be examined and signed each day or shift by a designated MACTEC–ERS PDC and the Subcontractor field supervisor.** The Daily Drilling Report is subject to further audit by MACTEC–ERS technical monitor assigned to this project or by MACTEC–ERS PDC. Any errors found on this report by the Subcontractor shall be reported to the MACTEC–ERS PDC as soon as possible for reconciliation. The Daily Drilling Report is a three-part, carbonless form. **The original (white) copy of this form shall be returned to MACTEC–ERS with the Subcontractor's invoices(s).** The yellow copy will be retained in the field by the MACTEC–ERS PDC and the pink copy may be retained by the Subcontractor to use as a rig copy.

4.5 Utilities Clearance

MACTEC–ERS will locate all utilities, such as power lines or gas pipelines that might be reasonably expected to exist within the work area. This information will be provided to the subcontractor prior to commencement of the work.

Grand Junction Office
2597 B ¾ Road
Grand Junction, CO 81503
(970) 248-6000

Drilling Report

State ________ County ________ Project ________________ Hole Name ________________ Hole No. ________

Drilling Contractor ________________________ Rig Type ________________________ Rig No. ________

From A.M. P.M	To A.M. P.M.	Footage			Drilling (check)					Description of Work
		From	To	Hole Size	Drl	Cor	Rem	Agr	Sam	

Materials Used (e.g., casing, cement, water, mud, etc.)	Remarks
	Drill Crew
	Driller ________
	Helper ________
	Helper ________
	Other ________

Contract Foreman ________________ GJO Representative ________________ Report No. ________________ Date ________

GJPO 1706
Rev. 10/96 White—Return to GJO with Invoices(s) Canary—GJO Field Copy Pink—Rig Copy

Figure 4-1. Daily Drilling Report

4.6 Quality Assurance

MACTEC–ERS will oversee all fieldwork. The Subcontractor shall perform and complete all fieldwork in accordance with the requirements, specifications, and procedures set forth herein. Periodic surveillance visits by other MACTEC–ERS personnel may be scheduled to verify Subcontractor's compliance with the requirements, specifications, and procedures set forth herein.

4.7 Permits and Licenses

MACTEC–ERS will provide all necessary access and exploration permits as well as any permits for cuttings/fluid disposal as required by Federal, State of Utah, or other controlling agencies. The Subcontractor shall acquire any drilling and/or contractor license(s) required by Federal, State of Utah, or other controlling agencies. Specifically, the subcontractor will need to acquire a valid Utah Sate water well license for drilling and installing alluvial monitoring wells.

4.8 Material Storage Facility

MACTEC–ERS will provide an area at the east entrance staging area of the Millsite for drilling equipment and material storage. All well installation materials, e.g., screens, casings, primary and secondary filter packs, bentonite pellets, bentonite grout, and cement shall be delivered to each well site in factory sealed containers until used in the well installation. The Subcontractor is responsible for properly storing all well installation materials. The Subcontractor shall supply pallets and waterproof tarps (or equivalent) to protect the materials.

4.9 Inventory

Prior to starting work, the Subcontractor and the MACTEC–ERS PDC shall conduct an inventory to ensure adequate materials and supplies to perform the work are on the site and usable. This inventory, signed by the Subcontractor and MACTEC–ERS PDC, will be entered in MACTEC–ERS PDC's field notebook and a copy made available to the MACTEC–ERS Contract Administrator.

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5.0 Health and Safety

All work shall be suspended when an unsafe practice or condition is observed. Work shall not proceed until the unsafe practice or condition is corrected and the PDC, or designee, approves the resumption of work. The Subcontractor shall not be compensated for efforts required to correct any unsafe practice or condition created by its actions.

All applicable safety regulations and requirements shall be strictly adhered to at all times. These regulations and practices shall include, but are not limited to, the wearing of approved safety hats, safety shoes, and safety glasses, etc. No unauthorized personnel, private vehicles, cameras, firearms, personal pets, illicit drugs, or alcoholic beverages shall be allowed on the designated project area.

The PDC, or designee, in collaboration with the MACTEC–ERS Project Safety Coordinator, will be responsible for operational health and safety coverage during the drilling activities. This may include the issuance of personal protective equipment such as coveralls, gloves, and boot covers for workers. All Subcontractor personnel shall adhere to MACTEC–ERS operational health and safety regulations as outlined in the *Drilling Health and Safety Requirements*, MAC–2012, Revision 2, May 1999. All Subcontractor personnel (and alternates) who will work on this project shall be required to attend a pre-work briefing on the drilling health and safety requirements and the project safety plan, prior to any work being performed on this project. This briefing-orientation will be held on-site as soon as the Subcontractor has mobilized their equipment to the project site and will identify safety and health hazards associated with the site.

The "Statement of Understanding" contained in Appendix A of the *Drilling Health and Safety Requirements*, MAC–2012, Revision 2, May 1999, shall be signed by all Subcontractor personnel prior to working on this project.

5.1 Site Sanitation Facility

The Subcontractor shall meet the sanitation requirements of 29 CFR 1926.51 (OSHA) for potable water and portable toilets.

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6.0 Subcontractor Qualifications, Performance, and Requirements

6.1 Subcontractor Qualification

Due to the technical nature of the work, the successful offer shall be a first-tier subcontractor to MACTEC, shall have a minimum of 5 years business experience in environmental water well drilling, and shall have the ability to provide the necessary and required drilling equipment.

6.2 Weather Days

The Subcontractor shall not be compensated for any delays caused by weather nor shall the Subcontractor be penalized for any delays caused by weather. If unforeseeable delays occur which are uncontrollable by MACTEC–ERS or Subcontractor, the completion date may be extended by the MACTEC–ERS Contract Administrator. Credit of days due to weather shall be added to the period of performance. A "weather day" applies to any normal work day when weather conditions deteriorate to the point that field work is neither safe, nor practical and when four hours or less of work have been completed. The Subcontractor, in consultation with the PDC, will decide whether or not to continue work.

6.3 Standby Time

Standby time is lost work time caused by MACTEC–ERS activities. The Subcontractor shall be paid in accordance with the stipulated standby time rate. **Standby time will only be paid when authorized by MACTEC–ERS PDC.** Standby time will not be paid for Subcontractor equipment breakdown, missing Subcontractor equipment, insufficient supplies, or missing or tardy Subcontractor personnel.

6.4 Work Day and Rotation Schedule

The normal work day will consist of a minimum of eight (8) hours per day or through completion of a given well or boring. The work day shall be limited to the period of time starting no earlier than one-half hour before sunrise and ending no later than one-half hour after sunset. In all cases, MACTEC–ERS reserves the right to limit the length of the work day based on safety concerns. The Subcontractor is responsible for obeying all Federal and State of Utah labor laws, rules, and regulations. Holidays excepted, the normal work schedule will consist of a "10 day on - 4 day off" rotation and will begin on a Tuesday and end on Thursday of the following week, or as mutually agreed.

After the work is started, the work schedule may only be changed or altered with the written approval of MACTEC–ERS PDC. Any desired change shall be submitted in writing to the MACTEC–ERS Contract Administrator by the Subcontractor at least five (5) working days prior to the desired change.

6.5 Submittals

The deliverables are listed below in Table 6–1.

Table 6–1. Submittal Schedule

Submittal	Schedule
Technical Proposal Exhibit B (Technical Approach by Task, Proposed Equipment List, Company Personnel and Experience)	Submit with response to the Request For Proposal (RFP)
Business Proposal Exhibit C	Submit with response to the RFP
Proposed Work Schedule	Submit with response to the RFP
Filter pack specifications	Submit with response to the RFP
Bentonite pellet and grout specifications	Submit with response to the RFP
Screen size specifications	Submit with response to the RFP
MSDS sheets for all materials to be brought on site and chemical inventory. Include type and brand of downhole tool lubricants to be used. Submit to the MACTEC–ERS PDC.	No later than 5 working days prior to mobilization or delivery to the site
Work Schedule Change Request submitted to the MACTEC–ERS Contract Administrator.	No later than 5 working days prior to the effective date of the requested change
Copies of reports, logs, and other required documents submitted to the State	No later than 30 calendar days after completion of work
Subcontractor Invoicing	As determined by Contract Administrator

EXHIBIT B

TECHNICAL PROPOSAL INFORMATION

MONTICELLO, UTAH – WELL DRILLING PROJECT

1.0 Technical Approach

1.1 Proposed Drilling Method

Drilling method is: Sonic

Drilling rig model, specifications, and year manufactured: RD-300 Rig # 1511 mfg. 1998

(Your may submit your company's printed rig/equipment specification sheet for this information)

1.2 Borehole diameter:

The 2-inch monitoring wells shall be installed in boreholes with a minimum diameter of 6" inches.

1.3 Drilling Depth

The 2-inch monitoring wells shall be installed with a(n) 6 -inch diameter bit size having a depth rating of 500 feet.

2.0 Prior Experience and Past Performance

2.1 Company Experience

Describe your company's work experience in conventional environmental water well installation and site investigative drilling, i.e., number of years, types of projects, size of projects, typical borehole depths, experience of drillers, experience of driller helpers. (You may submit your company's Statement of Qualificition or Qualification Card for this information)

See Attached

2.2 Personnel Experience

Our company shall use Rob Cain as the driller(s) for this project. He/she has 3 years of experience as a driller (see attached resume).

2.3 License

Our company and driller shall perform the work under the State of Utah Water Well Driller's License No. 568, which expires on 12/31/00. (See attached copy)

2.4 Past Performance

Provide the following information on 4 companies that your firm has completed environmental well installations or site investigative drilling for. If your company has previously worked for MACTEC-ERS, use it as a reference.

Company: See Attached

Address: _____

Contact: _____

Telephone: _____

Company: _____

Address: _____

Contact: _____

Telephone: _____

Company: _____

Address: _____

Contact: _____

Telephone: _____

Company: _____

Address: _____

Contact: _____

Telephone: _____

Company: _____

Address: _____

Contact: _____

Telephone: _____

3.0 SUPPLEMENTAL INFORMATION

The information provided by the offeror in this section is not part of the evaluation criteria.

3. 1 Proposed Equipment, Materials, and Supplies List

The offeror shall list all of the proposed equipment and supplies that it shall furnish to the site on mobilization that it deems necessary or required by its particular drilling method to complete the work. The offeror may provide additional attachments, if necessary. Upon mobilization and prior to the start of the work, the offeror and the MACTEC Project Drilling Coordinator shall conduct an inventory to ensure that all equipment, materials, and supplies listed below are at the site and usable.

Amount of drill pipe on site (ft): 100'

Number of drill bits on site for all well sizes (ea): 3

Grout pump(s) – quantity, manufacturer, model, capacity, pressure rating:

3L6 Moyno 10 GPM @ 150 #

Tremie pipe(s) – quantity, manufacturer, model, length, and diameter: 1"x10' Boart Longyear

Submersible pump(s) – quantity, model, type, rating, diameter:

SQE7-07 Grundfos 10 GPM @ 100' 2 3/16" Dia.

Bailer(s) – quantity, model, type, length, diameter:

Surge block(s) – quantity, type, diameter: 1-2" Boart Longyear

Decontamination equipment: Hotsey Steam Cleaner

Accessories and ancillary equipment: Miller Welder

1998 Mack Water Truck

Welding and cutting equipment: Miller Welder

Capacity of water tank or water truck: 2,000 gallons

Well casing – quantity, manufacturer, and type for each well size: 2" ASTM sch. 40 Boart Longyear

Well screen – quantity, manufacturer, and type for each well size: 2" ASTM .010 slot Boart Longyear

Primary filter pack – quantity, size, manufacturer: Colorado Silica 20-40 mesh

Secondary filter pack – quantity, size, manufacturer: Colorado Silica 60 mesh

Bentonite seal – quantity, size, and manufacturer for each hydration rate: Baroid Bentonite Pellets 4"

Bentonite grout – quantity, percent solids, and manufacturer: Baroid Casing Seal 30 percent solids.

Centralizers – quantity and type for each well size: Boart Longyear 2"

4.0 General Notes

The equipment proposed herein shall be subject to the following:

- Inspection(s) may be made by MACTEC personnel prior to the award. Upon request, the offeror shall provide additional information about previous site investigation work.

- Drilling rig trucks and/or carriers shall conform to all applicable Federal, State, and local safety requirements and regulations. Each truck or carrier shall be equipped with two DOT approved, fully charged 2A:40BC dry chemical fire extinguishers, with current inspection tags.

- The drill rig and all subcontractor equipment/accessories shall be placarded in accordance with OSHA regulations.

- **In the event of an award, the equipment proposed herein shall be the equipment used to perform the work.**

COMPANY: Boart Longyear Co

ADDRESS: 7773 W. Seldon Lane

CITY, STATE ZIP: Peoria, Az 85345

CONTACT: Ken Williams

PHONE/FAX/E-MAIL: ph: 623-486-1881 fax: 623-486-1885
KWILLIAMS @ BOARTLONGYEAR.COM

NAME AND TITLE: Ken Williams Manager

SIGNATURE: [signature]

DATE: 4/27/00

My signature above certifies that the information contained in this EXHIBIT B is true and accurate to the best of my knowledge and belief. Further, in the event of award to our company, all equipment and personnel shown herein shall be used to perform and complete the work.

Exhibit B Qualifications Statement

TECHNICAL APPROACH

Boart Longyear makes it a standard practice to employ a highly skilled staff of Field Supervisors, Drillers and Driller Assistants to ensure that each project is completed on safe and timely manner.

Boart Longyear has successfully completed several projects throughout the United States with a scope of work similar to this project using a Roto-Sonic 150 drilling rig and crew. This drilling process will utilize a 5 1/2" casing with a nom. 6" diameter Bit and a 4 12/" core barrel to provide a continuous core sample to total depth of the borehole. Using this technology the client will be provided an undisturbed sample of the formation being drilled which will enable him to make a qualified decision as to the depths of and extent of contamination.

Boart Longyear proposes to complete this project in the following manner:

Mobilization

The mobilization will consist of moving all the equipment and supplies necessary to complete the project from its most previous location to the specified site or from our Phoenix Arizona office whichever is closer. The rig and tools will be decontaminated prior to arrival and after each boring is completed.

Drilling

Drilling will consist of advancing the 4" x 5' core barrel into the formation using the vibrasonic top drive. A 5 ½" casing is advanced behind the core barrel. The samples will be retrieved to the surface and transferred into a polyurethane bag, the bag will be closed stapled and labeled at the direction of the client. On the "core" holes a lexan liner will be filled labeled, and capped. Tubes are charged each there will be no credit for partially filled tubes There will be a small amount of waste in the bottom of the hole each time the casing is advanced these drill cuttings will be used to backfill boreholes and spread on the ground at the direction of Mactec ERS.

Sampling

Once the drilling process is completed, the sample bags may be opened and representative samples may be spooned into a jar or other containment vessel. If required a split spoon sampler may be employed.

Well Construction

Each borehole will be converted to a vapor monitor well or abandoned per the clients' instruction as outlined in the scope of work. Existing well abandonment's will be performed by grouting. Well Logs and abandonment permits to be provided by client.

DRILLING EQUIPMENT LIST

- Roto-Sonic 150 Drill Rig
- Flat Water Fleet Truck with jib arm hoist, 2,500 gallon capacity
- One Ton 4X4 pickup
- 5 1/2" Sonic casing (50)
- 2 3/8" Drill pipe (50')
- 4" Corebarrels (2) Standard
- 4" Corebarrels (2) Liner Type
- 5 ½" Casing (50')
- 1" Tremmie Pipe 250'
- 6" Bits (2)
- 4" Bits (3)
- Drum lift
- High pressure stream cleaner
- 300 Amp welder, generator
- Moyno cement pump
- Cement batch mixer & tank
- Fishing tools for all in hole equipment
- Level "C" Safety Equipment (PPE)
- Level "D" Safety Equipment (PPE)
- Cellular telephone
- Hand tools required to perform maintenance & repairs
- First Aide Kit, including: solar blanket and blood borne pathogens kit
- Fire Extinguishers
- Rig pad liner
- Oil absorbent materials
- Cement and bentonite grout as required
- Hard hats, steel toe boots, gloves and other personal protective equipment
- Complete MSDS reference book

CLIENT REFERENCES

Mactec ERS
2597 B ¾ Road
Grand Junction Co. 81503
Att: Court Lisle
Ph: 970-248-6648 Fax: 970-248-6320

Tetra Tech Inc.
630 North Rosemead Blvd.
Pasadena Ca. 91107
Att: Tom Villenueve
Ph.: 818-449-6400 Fax: 818-351-5291

Foster Wheeler Environmental Corp.
611 Anton Blvd., Suite 800
Costa Mesa, California 92626
Att: B.G. Randolph
Ph.: 714-444-5527 Fax: 714-444-5560

ASL
1130 E. Missouri St.
Suite 110
Phoenix, Arizona 85014
Att: Dino Gotis
Ph.: 602-263-9522 fax: 602-263-7765

Arizona Dept. of Environmental Quality
3033 N. Central Ave. #762
Phoenix, Az. 85012
Att.: Michael Nesky
Ph.: 602-207-4215 Fax: 602-207-4236

Cortez Gold Mine
Star Route HC66-50
Beowawe Nevada 89821-9708
Att: Lawerence Goss
Ph.: 775-468-4400 Fax: 775-468-4496

FIELD PERSONNEL

Operations Manager: Rob Reedy

Rob has over 13 years experience in the drilling industry. His responsibilities include supervising operations of all sonic drilling projects in the Southwestern U.S. Rob is highly experienced with the drilling of soil borings, construction of ground water monitoring wells and soil vapor probe wells, as well as mud rotary and diamond core drilling techniques. If any problems arise during this project he will be available by phone or pager. Rob may be on location from time to time and throughout the project for site visits should any problems arise. If required Rob can be available on a full time basis.

Office Phone: 775-246-0296 Mobil Phone: 602-315-0531
Home Phone: 775-853-1547

Field Supervisor: Dan Casey

Dan is a highly qualified driller / rig supervisor that has completed several projects similar to this scope of work. References are available from many of the clients listed above. Dan's experiences over the past 15 years range from well installation and pumping services to his present position as a Field Supervisor. Dan will be on location to start the project and will be available on a 24 hour per day as needed basis

Office Phone: 800-808-2420 Mobil Phone: 602-418-0714
Home Phone: 623-439-0753

Rig Supervisor: Ron Cain (Anticipated)

Ron has been operating sonic drill rigs for the past 3 years. He was been involved with soil investigations and well installations at locations throughout the Southwestern United States. Ron has experience installing flute inflatable liners, Westbay systems, multiple interval vapor extraction and monitor wells. Ron has worked for a number of mining companies investigating rock dumps, evaluating tailings and leach pads, and performing groundwater migration studies.

Mobil Phone: 602-321-6435
Home Phone: 520-439-0753

Boart Longyear will be in contact with the driller on a daily basis regarding the progress to ensure that your project is completed in a timely and safe manner.

The crews assigned to this project will have 40 hour OSHA certification with 8 hour annual refresher and annual medical examinations required under OSHA regulations, as well as MSHA 40 hour certification and current 8 hour refresher.

LICENSES & CERTIFICATIONS (Western States)

Arizona Drillers License#	083
California C-57 License	694686
Colorado Drillers license	1197
New Mexico Drillers License	WD 1161
Nevada Drillers License	1365
Utah Drillers License #	568
Federal ID #	087-0503343

COMPANY INFORMATION

Boart Longyear is a leading supplier of products and services to the international mining, quarrying, construction, and engineering industries. The companies name comes from the union of two of the drilling industries pioneering companies. Boart was founded in Johannesburg, South Africa in 1936 by Sir Ernest Oppenhiemer who discovered new uses for low-grade industrial diamonds known as "boart." Longyear was established in 1890 by Edmund J. Longyear when he began work as a diamond-drilling contractor in the Mesabi Iron Range in Minnesota.

Boart Longyear is on the forefront of technology introducing new drilling systems such as the LS-244 core drill and the Sonic drill rigs. Boart Longyear designs and manufactures a complete line of core, percussion, and environmental drill rigs as well as down hole tools, well materials and geotechnical instrumentation for the mining, construction, environmental, and geotechnical community.

At Boart Longyear job safety is very important. Through constant training, instruction and consistent use of best practices, the company boasts one of the best safety records in the industry. Boart Longyear has recently incorporated a Behavior Based Safety Management System to bring the level of awareness to the next level and assist us in identifying at risk behavior before an accident occurs.

Today, Boart Longyear has more than 9,000 employees in 60 countries spanning 5 continents.